LOOKOUT

LANDSCAPE PHOTOGRAPHY:

A

Practical Manual

EMBODYING

THE FORMULÆ, PROCESSES,

AND

METHODS OF OPERATING

USED AND PRACTICED BY
THE LATE

PROF. R. M. LINN,

OF LOOKOUT MOUNTAIN, TENNESSEE.

PHILADELPHIA:
BENERMAN & WILSON, PUBLISHERS.
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LANDSCAPE PHOTOGRAPHY.

IN presenting our method of operating in Landscape Photography, we make no claim to originality, or startling announcement of new discoveries; but the processes are such as we have used in our practice, and were adopted after earnest experimenting and persevering research for the very best. There are doubtless old professors in the art who will find little of service to them; but the multitudes in the craft, who have not yet ventured in this most pleasant, healthful, and lucrative field, will here find plain and reliable directions. It is those we address more especially; and we will endeavor to be clear at the risk of being a little tedious.

THE MAIN REQUISITES of a GOOD PHOTOGRAPHIC LANDSCAPE, are *brilliancy* with softness, and *perfect definition* with strength. Keeping these cardinal points in mind we can modify the bath, collodion, and developer, or all three of these if necessary, to realize the proper chemical effect.

There is also much depending on

ARTISTIC EFFECT.

To secure a pleasing if not a striking picture

requires some judgment and taste on the part of the operator. He will select according to his eye the most favorable point of view for the whole picture, remembering, however, that the *foreground* is an important part of a landscape, and should not be too plain and meagre, nor yet overloaded with small objects, or the *middle-ground*, which will generally embody the principal or striking feature of the picture, will be eclipsed.

Strive to have a few simple objects broadly delineated and tastefully distributed in the foreground, if nature does not furnish in the right position; in an otherwise desirable view, have some objects that may be at hand placed in it, and quite *near the instrument*. A figure or so is a great addition if judiciously arranged.

In an ARCHITECTURAL VIEW, the selection of position is more or less arbitrary, but these general principles of art should be kept in mind, and realized as far as practicable. The distance should be clearly, if not sharply, defined. Presuming that the instrument and materials are right, the other condition of success is, an atmosphere free from smoke or haze.

Much depends on

PROPER ILLUMINATION.

For fine chemical effects and a harmonious blending of light and shadow, a *clear*, *bright*, *quiet* day is the best, especially for large views, and, as a rule, the larger the more decided the

contrast should be. A *flat* picture is always a failure, artistically and financially considered. They won't sell, whatever may be said of the taste of the public.

Stereoscopic views require *great softness, perfect delineation, cleanness of manipulation*, and a certain yet subdued brilliancy.

THE DIRECTION OF LIGHT

is also of great importance. It should so fall on your subject as not to give an undue portion of either light or shadow, especially not *all light or all shade.* In stereoscoping, a deviation from this is admissible in rare instances—such as taking a sunset or sunrise, or cloud studies. For large views, a safe rule is not to work either squarely from the direction of light or facing it, but rather *obliquely from the light*, either to the right or left. Some subjects require a soft subdued light, when the sun is not shining brightly or at all, such as deep hollows or glens with overhanging cliffs, or a mirror-like sheet of water facing the light.

CLOUDS

are an important feature with every painter of landscapes, often lending an enchanting effect to the whole picture. Of course, we have not the resources at command they possess, but much may be done even with a photograph.

Our method in large work, where there is considerable sky, is to *mask* or *cover the back of the whole negative* with *tracing linen;* then proceed to work up the clouds by applying in places a thin coat of color. For full details of the process, refer to the article on page 15, "To Print Clouds." If skilfully done, grand and natural effects may be attained with it.

LENGTH OF EXPOSURE

is a nice point, and our general rule is to—*do it just right*, and is almost an act of intuition. *Avoid* under-exposure rather than otherwise, or your work will lack softness and detail, while if overdone it will be flat and without crispness. The latter precaution applies in a special manner to large views. The proper timing and development will have an important effect in giving *tone* to the resulting photograph, which should be warm, brilliant, and of great purity, with transparency and depth in the shadows.

Blue, *measly*, *and smutty* tones are never admissible in a view, and I might add, in a photograph of any kind.

APPARATUS FOR FIELD WORK.

A dark-tent is indispensable, and anything the ingenuity of the artist may suggest will suit for this purpose. It should be of material strong and close in texture, for cover, and double at

that. It should also be portable, yet roomy enough to work in. The color of the lining should be yellow. This will afford light to work by, and neutralize the actinic rays of light. It should be so made as to lap closely at the entrance and at the bottom. *Use no artificial light here*, and take every precaution against *fogging*. We would recommend a tent made on the principle of an umbrella, with the sides flaring or bell-shaped, having to correspond with the handle a light but tough centre pole, and stay-ropes with iron pegs at the top to hold all in position. The tent is best to be square-shaped, and the braces for extending the top should reach to the upper corners.

The bottom part should be stretched out with *braces* to *bear out downward* to the lower corners, and they should rest flat on the ground when the tent is set. Provide a stop at the bottom of the pole to prevent the sleeve, from which the lower braces radiate, from slipping off. The pole should be shorter than the canvas, and the lower braces should not reach quite to the bottom of the canvas. Stay the open side with a rope, at the bottom of the entrance, in a line with the braces. Have a broad fly to lap well over the opening, and key the upper and lower braces in place. Have a U-shaped peg to clamp the stay-rope down, to prevent tripping. The extremities of the lower braces may be clamped down in the same manner, and, unless very

windy, will serve the purpose of stay-ropes at the top, which should always be *attached and ready*. The pole will not be in your way if you bring your left shoulder to bear against it while operating.

ON THE SELECTION OF VIEW LENSES.

Aim to get the best. This is important if you would make success and excellence sure. Have them *warranted* to be all right, before purchasing, in these *essential points*. They should give a *sharp impression* from centre to margin of the largest size plate. There is no such thing as getting a view too sharp. It should be *free from distortion*. This is especially important in architectural views, copying, &c. In using the full size of the instrument all straight lines should be rendered perfect in the margin with the smallest stop.

Equal Illumination.—The light acting with equal vigor on all parts of the plate, and free from central spot, or ghost. We will venture to say that no man will regret investing in a "Ross" or "Dallmeyer," or even in a good "Globe Lens." There are doubtless others quite as good; and the "Steinheil" may be named as worthy of trial, judging from the high indorsements it has received.

CAMERA BOXES.

Have your lenses mounted on a light, well-

made camera box. For stereoscopic work, no operator can wish for anything better than those known as "John Stock's" make (now made by the American Optical Company). They should be elegant and perfect in workmanship, not too heavy, and sufficiently rigid on the upper side to secure the plate-holder in exact focus. In using a box that is liable to cause failure in this respect, provide some device for staying it. This precaution will save you from great and trying vexation. We know no reason why—as a practical photographer suggests—the front of a camera box should not be considerably reduced in size. The light diverging from the lens to the back of the box, the front, sides, and corners would evidently bear and be the better of considerable pruning.

For a *view camera stand* the tripod, or three-legged one, is the thing.

A plate box is a necessary part of an outfit, and should be well stored with clean negative plates. If for large negatives, the glass should be of "double strength."

THE BATH CUP.

One of glass is our first choice. The Lewis Baths of large size are very good, but also very heavy. The German solid glass are far superior. We have come to liking, after long use, the

photographic ware bath; they answer every purpose, and are lighter and cheaper.

In making the

PRELIMINARY PREPARATIONS

for a view trip, do not fail, in packing chemicals, to have a full supply of such as you may need for modifying purposes. You will probably find a different temperature from the room, which will necessitate some change in their preparation. You will therefore provide the means of doing so in small quantities, and in a safe, compact shape. Lay in some good alcohol for thinning your collodion. Bromide of cadmium for softness, if bath or collodion is too harsh; *use it very sparingly*. Pure nitric acid for your bath; but beware of dosing it with *too much* of it, or your collodion will slip off the plates, and render strength in a negative impossible. Acid for the developer: *Carbonate* of silver, if the bath should become too acid. *Nitrate* of silver, if too weak. Permanganate of potash, to purify and restore if it should become foul or work streaky. And by all means do not forget filtering material and test-paper. If for a long excursion, the hydrometer may come in play, and salts of iron; and you may possibly need some strengthening agent, for which we advise sulphuret of potassium and chloride of gold.

TAKING THE FIELD.

Having arrived at the chosen spot, pitch your tent in a cool, shady place, as convenient to the location of your camera as possible.

Put things in order for operating. Go to work with coolness, deliberation, and confidence. Throw off all care, constraint, and nervousness. Woo Dame Nature in her mildest and happiest mood. Let your soul be inspired and your senses charmed by her matchless beauties. Take your time to it. Strive lovingly, perseveringly, intelligently, and that measure of success which crowns the true artist will gladden your heart at last. Let every weary, careworn operator take a new lease on life by making a campaign to the woods and mountains. Emancipate yourself from the routine of the gallery, and the baneful odors of the chemical-room, for communion with Nature and the health-giving breezes of heaven.

Do not waste your time or material in operating on a windy day; you will have ill-success when every leaf and branch is swaying in the wind. Take a number of positions for your view, and of course publish only of the *best* negatives; and lastly, let me close this chapter with a caution againt excessive "*tinkering.*" Learn to let *well enough* alone, in the condition of your bath and chemicals; but *never work with them out of order.* Dry and varnish your best negatives on the spot. Do not run the risk of losing

them by standing them around the tent or other exposed positions. Add your nitric acid to the silver solution *first*, then throw in a slip of blue litmus paper, which will now turn red and show acid in excess, then add, cautiously, ammonia until the test paper is a decided blue. These agents vary so in strength that it is impossible to give definite proportions; hence, to know the *exact* condition of your silver solution or printing bath, do not depend on guesswork, but use test paper and the hydrometer.

HINTS ON PRINTING AND FINISHING.

Highly glazed albumen paper is indispensable for stereographs. Heavy, thick, tough, glossy paper is most suitable for large views. Formulæ given with the paper may be followed.

The next step with a cautious printer, is to try the solution with a small piece of paper, which should be sensitized, thoroughly dried by artificial heat, fumed with ammonia, and printed on a dry printing-frame and pad. This precaution will enable you to see what is wanting, and to make sure work, before silvering a quantity. If the print appears too foxy or red, and lacking clearness and brilliancy, add a little more ammonia. If too blue and cold, with excessive bronzing, add more nitric acid. Alcohol is sometimes used to prevent the albumen from dissolving off the paper, but it is advisable to use it

only as it may be necessary for this purpose. To prevent discoloring use a weaker solution, or reduce the time of floating the paper, and, if possible, silver in a cool, dry room in summer, and dry, warm room in winter. Avoid a humid, damp atmosphere. Silver your paper in a dark, dry room, and you will seldom be troubled with discolored paper. By a *dark*-room, I do not wish to be understood as advising one of blinding darkness for any purpose, but admit *yellow* light, sufficient to work by. Print with care and judgment—neither too light nor too dark; and a negative having a *very plain foreground*, may with advantage have the corners lopped off by making an oval vignette of the print.

To Print Clouds.—It is seldom possible to get fine clouds in a large negative, owing to the great length of exposure, and the lack it may be of them in the sky at the time of taking the view. By the method we give you it is possible to realize all that you may wish for in the way of clouds. It is a field of work in which you can give reign to fancy, but at the same time you must study nature, and learn from her what shapes and characters they assume, or you will be *false and fantastic*. However, it will be better to run the risk of making mistakes here than to adopt the unartistic—not to say barbarous—plan of masking the sky out, and printing it a clear, white, blank space.

To prepare the Negative for Cloud-printing and Retouching.—Procure a fine and very transparent article of tracing linen, then make a good strong print from your negative, tone, finish, and mount on cardboard. Cover the whole picture with the linen. Fasten at the corners, then cover with a clear glass. This will enable you to study your picture and determine where and how to put in the clouds. Observe also if any part of the landscape may be lit up with advantage. Then after removing the glass from the portion of the picture you wish to work on, proceed to lay in the light portions of your clouds with a water color paint. A yellow tint will be the best for this purpose. If any blemishes appear in the negative, manage to cover them as you lay in the clouds. A thin glazing of color on portions of the landscape may make a great improvement. A view in which great distance is shown will often, if not invariably, render the middle-ground in dark heavy masses, which if relieved with light would give it a more harmonious gradation, and greatly improve the perspective. If the foreground is flat and wanting in contrast, fine effects in light and shade may be attained in this way, but use a thin glaze, and by all means avoid harshness. This process will enable you to make that magic transformation in landscapes which *retouching* gives a face picture.

After laying in the clouds and glazing other portions of the linen, attach firmly on the *glass*

side of the negative, and print through a screen of tracing linen, which for convenience should be stretched upon a square frame a little larger than the printing-frame. This will impart a fleecy, natural softness to the clouds.

THE TONING BATH FOR VIEWS

should give warm purplish (not red-brown) tones. Either citrate or acetate of soda, or both combined, will give the desired tint when used in preparing the bath. We prefer the citrate of soda for certainty and brilliancy of effect in toning any kind of a print, however weak, and advise this method of making a toning solution with it. Pour in a toning-dish—which should be white—sufficient water to float a portion of the prints while toning. Add of gold solution sufficient to tone a print in one or two minutes. *Then throw in a slip of test-paper;* then a few grains of citric acid; lastly, add a saturated solution (in stock) of bicarbonate of soda, or common baking soda, until the test-paper turns blue. Prepare the solution *before washing the prints*, as it works better for standing a short time before using. This makes an excellent toning bath for views, and works to perfection a few minutes after it is prepared. Acetate of soda may be added sparingly if warmer tones are desired, but it does not give tone to a print so promptly and economically as without it. Keep your litmus paper in the solu-

tion until done using. Let it be a monitor while making, strengthening, and modifying. This will make toning easy and sure work. To *prepare for toning*, wash the free nitrate of silver out of the prints. After washing, soak a few minutes in water salted with table salt—a little brackish only—until they are slightly red, then change them to fresh water.

FIXING AND WASHING.

Use a strong solution of hyposulphite of soda; fix the prints in fifteen or twenty minutes. Have plenty of it in your fixing bath. Throw the whole batch of prints in, if not too bulky—*face up* to avoid bubbles; separate and change so as to fix evenly and without spots. After fixing, drain off and throw the mass of prints into clean fresh water—*face down* to avoid sediment. Be careful not to get a trace of hypo in the toning solution, as on the prints before fixing, or they will be ruined with dingy yellow spots, which may be gotten rid of *with fire only*.

The hypo should be handled by an assistant, or let alone until done toning. If you make it up before to gain time, wash your hands thoroughly with soap and water. Old printers and professors will pardon me for raising a warning voice here, but our successors like ourselves may run on breakers at this point.

Never use a fixing solution the *second* time, if

you value the permanence of your prints. Wash them thoroughly in clear water. There are many devices for doing this suggested by different operators and writers. We have had but little experience of late years with the newer inventions for this purpose, having for the last seven years free use of a clear crystal spring that bursts from the brow of "Old Lookout." But whatever you use for this purpose, you will find *water* the main thing. Use plenty of it, and get a good portion of the hypo out of the prints as soon as possible by changing frequently, after which let them lay with plenty of water running over them for several hours.

Suggestions on Mounting.—Use a good stiff mounting-board. Give good margin to the print. Trim true, and to make a finished job of it, line and letter. If wanted in any quantity have the lithographer give you a helping hand. This is for large views. For stereographs, use heavy buff stereo mounts, with rounded corners. To finish, roll with the bed-plate of your press made hot to brighten the gloss.

To Cut Stereo Prints.—The Bergner cutter is indispensable for those having large quantities to finish; but for those having small lots to mount, a glass *pattern plate* will answer every purpose. We will give you a simple rule for making it. Lay down a piece of glass on a stereo card, cut the glass so as to leave a full eighth of an inch margin on the ends and sides; then with the

diamond, scratch two lines across the middle of the glass, three-fourths of an inch apart, and parallel with the ends and with each other. To use, cut the print the full size of the glass; next slide it to your left so as to bring the left-hand line to the left side of the print, cut across it at the right-hand end of the glass, and finally give another slide to the left, and cut off the three-quarter slip or centre of the print. The two prints so cut are ready for mounting, and should be of equal size.

To Mount Stereo Prints.—They should be transposed or reversed from the position they had in the negative. To secure this arrangement, lay the pieces as you cut them in a pile, *face up*. In mounting, this brings the *right*-hand picture of every pair uppermost, which must be set on the *left hand* of your card. Leave a small space between them and equal margin at the ends.

Formulæ and Processes for Landscape Photography.—The use of pure chemicals, the best you can get, a judicious, careful, and *uniform* method of compounding them, are points strongly urged upon the operator as the surest means of securing certainty, if not infallibility, of results. It is advisable to study, experiment, and glean carefully over the field of experience, both of your own and of others; but once satisfied of a really good process, hold quite steadfastly to it until certain of a better one.

Ever-Ready Iodizer, for Landscape Photography.

Alcohol (Atwood's Patent),	16 ounces.
Iodide of Cadmium,	1 "
Iodide of Ammonium,	2 "
Bromide of Ammonium,	1 drachm.
Bromide of Potassium,	1 "
Bromide of Cadmium,	2 "

Remarks on Preparing and Using Iodizer.— Pulverize the flinty salts (bromide of potassium), add this and the bromides to the alcohol *first;* let it stand a few hours, then add the iodides. When settled it is ready for use, and keeps any length of time without changing. Decant from the stock-bottle as you use it.

To sensitize, take—

Iodizer,	1 ounce.
Plain Collodion,	10 "

or to proper density. Experience will soon enable any operator to hit the right proportions. It is advisable to have a scale or file-mark on the upper end of the collodion vial or bottle. Note carefully the proportion necessary for the bath you use, then fix the degrees.

The next step is to test it. Be certain your bath is in perfect order. Flow a clean negative plate; after sensitizing it, if quite transparent and bluish it needs more iodizer, which add but little at a time; or, if quite dense, and giving

after development a streaky, dingy, bad effect, it is over-iodized, and the remedy is, add more plain collodion until it gives a clean impression. We recommend this method of iodizing. It is always ready, saves weighing and measuring, gives fine effects, and works with great uniformity.

On the Management of Flowing-bottles, &c.— When done operating for the day, drain out the last drop of collodion from your flowing-bottle or vials into your stock of sensitized, from which decant back when ready to operate again. Keep all well corked. Avoid plate cleaning and dust in the dark-tent or chemical-room, and brush off all lint and dust from the glass before flowing.

Plain Collodion.

Negative Cotton, ...	1 ounce.
Ether (2 bottles), ...	40 "
Alcohol (2 bottles), . . .	40 "
Bromide of Cadmium, . . .	40 grains.

Mix the ether and alcohol, then add the cotton in small tufts, shake well, and after standing a day or so filter, and keep in a dark, cool place. It will work at once, but is much better to stand some time. For fine stereoscopic negatives a thoroughly ripened collodion is essential. Have a good quantity laid away for months ahead. The bromide of cadmium will facilitate the ripening. Use the best ether at whatever cost,

and "Atwood's Patent Alcohol." As soon as the cotton is fairly dissolved, test on glass, and temper to the proper consistency before storing away. If it is left *too thin and watery* until using, the thickening process, if done by adding cotton, will cause it to flow in knots and ridges. Have your collodion of a good consistency. It should flow more like fine oil than like water. We prefer using a little more alcohol than ether. *Thin* with alcohol, if necessary, when using it. The iodizer will give some excess of it, but not enough for hot weather. Plain collodion should be filtered to relieve it from particles that will not precipitate. It is best to do this when the cotton is first dissolved, and before storing it away to ripen.

The Silver Bath for Negatives.

Crystallized Nitrate of Silver,	40 grains.
Pure Water,	1 ounce.
Carbonate of Silver Solution,	5 drops.

If for copying or large view negatives, especially with the Globe lens, use of—

Fused Nitrate of Silver,	1 ounce.
Nitrate of Silver (in crystals),	1 "
Nitric Acid to neutralize, if alkaline.	

The first formula is for stereoscopic views or portraiture. We have the power with these

agents of producing every gradation of strength, from brilliant softness to harsh intensity.

The power of modifying with fused silver, and the resources of the negative bath, are generally overlooked by photographers, who, as a rule, seek in the collodion for desired chemical effects. This is good as far as it goes, but let a good silver bath be the basis of all your experiments. Keep it in order, and half the disappointments and failures that photography is heir to will vanish. Make it up in large quantities, and keep some in reserve purifying, and perhaps to serve you in a critical time. Use the actino-hydrometer, and keep your solution at 40 degrees. Add a few drops of permanganate of potash to make it a purple hue; shake it up, and let it stand over night; then decant and filter, and it is ready for use. Try a negative, and if the chemical action is harsh and foggy, clear up cautiously with nitric acid.

To Renovate an Old Negative Bath.—Reduce with water, and filter out the iodizer; pour out in an evaporating dish; add carbonate of silver sufficient to neutralize it, or rather in excess; heat up gradually with an alcohol flame; boil down about one-half or more to expel the ether and alcohol; let it cool, and decant off the pure liquid; reduce this with water to 40° on the scale of the hydrometer, or strengthen if too weak; finally, tincture to a purple with a few drops of the solution of permanganate of potash; let it

stand to precipitate and purify; decant off the clear liquid, filter, and afterwards exclude it from the light a few hours before testing and toning it up for use. *To fuse*, raise the heat, and continue the evaporation until it ceases foaming, and the residue has the appearance of melted wax. When cool, dissolve in a small quantity of water; bottle and keep in stock. Use for imparting vigor to a negative bath.

To Prepare Carbonate of Silver.

Take of—

Silver Solution—any quantity;
Carbonate of Potash in Saturated Solution

added until all, or nearly all, of the silver is precipitated. Be careful not to get in too much potash, as it will redissolve a portion of the carbonate of silver and cause it to precipitate too slowly. Make it up in a large bottle, so as to wash more expeditiously. Fill up with good soft water. Let it settle and pour off carefully. Repeat this washing—say ten times, or until the last trace of potash is washed out. Put the residue, which is carbonate of silver, in a small bottle and keep a little water on it, and set away in the dark. Always keep a stock of this on hand. It is the only proper substance to neutralize a negative bath. An old worn-out solution will answer to precipitate in this way, and you can hardly make a better use of it. It can be

added in any portion to the bath, or it may be composed of it by neutralizing with nitric acid, and reducing with water to the proper standard, 40°. *Do not use a printing-bath in preparing the carbonate.*

Permanganate of Potash.

The use of this invaluable agent in photography is a late discovery. We have found nothing better in the range of our experiments for purifying a silver bath, both for negatives and positives, and we esteem it one of the indispensables. We advise every operator to keep a solution ready for use, which is made simply by mixing—

Permanganate of Potash, .	10 grains.
Pure Water, ...	1 ounce.

Add to your bath solution before filtering, drop by drop (shaking it up), until it assumes a purple hue. After standing some time, the purple gives way to a brown, then brownish; and finally loses all color, the impurities of the water and chemicals, in the meantime, precipitating. It is now ready for filtering. Decant off the clear liquid without disturbing the sediment at first, as it will obstruct and delay the process of filtering. It is a good plan to add this solution to a bath if not ready for boiling down, and set it in the sun. The boiling should not be neglected after the solution gives a streaky, greasy effect

to a sensitized plate. Keep bottles expressly for purifying in. Never put any of these renovating or precipitating agents into your bath cup, as the sediment is hard to get rid of. A washing with nitric acid must be resorted to in such cases, followed with thorough rinsing.

The bottle or demijohn used for transporting your negative bath should be well muffled up, to protect it from heat and light, or it will fog, unless left to stand some time in the dark before using. For taking small negatives, a bath cup fitted with a rubber top is a nice thing, but do not use the smallest size. This would limit you to a scanty supply of solution, which would soon become fouled and exhausted. We prefer to work with a liberal supply, which lasts much longer without changing or giving out.

On the Preparation and Use of Developer.

Double Salts of Iron and Ammonia, ...	3½ ounces.
Pure Water (in half gallon bottle), ...	60 "

Pulverize the salts, or what is better, grind them in a coffee-mill. When the salts are perfectly dissolved, add (having left room for them in the bottle)

Nitrate of Silver (in crystals), .	20 grains.
Acetic Acid (No. 8), . .	3 ounces.
Alcohol, ...	2 "

Throw in the crystals of silver *first;* shake up until dissolved. The silver is used to carry down impurities such as chlorides or carbonates in the water. Were it used in *solution* it would instantly be precipitated by the iron, and would have only a partial instead of the thorough action the gradually dissolving crystals would secure. Every atom of silver will be thrown down, but it will take the grosser impurities with it. Next in order comes the acetic acid, and lastly, the alcohol. *Prepare the same quantity of Miller's Negative Developer*, according to the formula on the bottle, and for negatives use this and the preceding half and half. The *first* is a good developer alone, and should be used without the other when short exposure is necessary.

A large stock of a saturated solution of the iron and ammonia should be kept on hand, to be reduced and put in working order by adding the silver, acid, and alcohol as wanted for use, enough to last several days. To give the saturated solution of iron keeping qualities, half to one drachm of sulphate of copper may be added to the pound of iron. When it is used, Miller's developer is to be omitted.

For stereoscopic negatives it is best to use sulphate of copper developer, especially when softness and perfect definition of distances are desired; for interiors a freshly prepared developer of protosulphate of iron is best.

An easy, simple way to reduce the saturated solution, is to use a hydrometer kept for this purpose only. Take some solution (without acid or alcohol) of the desired or standard strength. Note the degree on the stem of the hydrometer, then reduce it to this in some quantity. Four or five parts water is near the right proportion. Then charge with the crystals of silver, acid and alcohol in the manner indicated. Use alcohol enough to make it flow smoothly in developing, and no more. In excess it softens the film and makes it more liable to injury in manipulation, and to a certain extent destroys intensity. Use *less* alcohol in *warm* weather and more in *cold*, and the reverse of this is the rule for acetic acid.

FIXING SOLUTION FOR VIEW NEGATIVES.

Use cyanide of potassium of moderate strength. If too strong it will make the shadows of your negative too open, and weaken the whole impression. Neither should it be too weak, or substituted by hyposulphite of soda, or the negative will lack brilliancy. Wash off thoroughly as soon as the fixing is completed.

ON REDEVELOPING AND STRENGTHENING AGENTS.

In our practice we seldom have occasion for strengthening a negative. The true artistic policy is to avoid the necessity for using any,

rather than making it the main reliance for securing intensity. For stereo negatives it is rarely to be resorted to, and then *only* with *chloride of gold*, prepared as for toning. A large negative, *weak*, but otherwise good, may be reinforced with some effect. We would here caution against redeveloping, which, unless nicely done, especially for a large plate, would result in streaking, clouding, or mottling—in short, ruining your work. Apply at once after fixing and washing, a weak solution of sulphuret of potassium to a blue tint, but *no farther*, as to a bluish-gray. This agent is in my judgment the least objectionable, and with it better effects are attainable than with any other substance employed for this purpose. Strive to avoid the use of any by keeping your bath fresh, and of standard strength, and if possible without sacrificing sharpness in taking a large view, refuse the smallest stop of your instrument.

TO CLEAN THE GLASS.

New plates should be laid in a weak solution of nitric acid, or they may be rubbed over with strong acid and laid by awhile, after which if properly cared for they will need no further treatment with it. They should next be *thoroughly washed*. If the least trace of acid is left on their surface the collodion will slip in the bath. Never allow your plates to lay around in the sink or other places, and the film dry or partially dry;

especially do not allow them to be piled on each other without cleaning and drying. It is far better to stand them separately, or clean off the plate before letting out of your hands, or if in some haste, lay them in a vessel of clean water—one in which there is not the least taint of grease in any shape. The slovenly handling of plates is a fruitful source of failures. Polish when dry with a mixture of alcohol and whiting, but do not do this in the tent or coating-stand.

TO PREPARE CHLORIDE OF GOLD SOLUTION.

It is advisable as a matter of economy, if nothing more, for every photographer to prepare his own chloride of gold. An excellent article can easily be prepared by the following directions:

Gold Solution.

Gold Coin, ...	$5 00
Nitric Acid (C. P.), ...	½ ounce
Muriatic Acid, ...	1 "

Put all into a glass-stoppered bottle. Warm a little, and when the acid begins to act on the metal, set it out of doors in the sunshine, or in a chimney corner, as the chlorine gas evolved in the operation is poisonous. When the coin is dissolved or nearly so, and the strength of the acid spent, add cautiously of bicarbonate of soda, but not enough to neutralize. If the solution turns greenish it is either neutral or has soda in

excess. In this state it will not keep, but will soon precipitate. To prevent, add a few drops of nitro-muriatic acid (one part nitric acid, two parts of muriatic acid) until the greenish hue gives place to a golden. *To make sure work* test with litmus paper. Finally, fill up the bottle with pure water. It is now ready for use.

We have followed this method of making for many years, and have never found any salts of gold more reliable. *Use coin or pure gold. Do not tamper with a base metal.*

PASTE FOR MOUNTING PHOTOGRAPHS

should always be fresh. A stale, sour article would soon destroy the print. Prints should be dried, rolled or finished before fermentation can take place in the paste after mounting on the card. Paste is best made of cornstarch, and should be used when warm. It must not be *watery* nor *mushy.* Keep it free from dust and sandy particles. Wash the paste from the brush when done using. Remove immediately any foreign substances or lumps that may be under the print, or paste that may be on the face of the print, or it will mar the gloss. It may seem useless to point the way in such a plain path as this. But it is a matter of *great importance* to see your work *properly finished. Perfection can never be realized without due attention to little things.*

THE OPERATOR'S ORACLE,

For convenient consultation in time of trouble.

The most frequent and formidable difficulty of the young navigator in photography is Fog. We would not advise you to follow the plan of a bibulous sea-captain to dispel it. This would probably more completely mystify the operator, who may need all the wits he can command to find his way out. *Your first duty will be to ascertain the cause.*

If the leak is in the plate-holder or camera, *the fog will be in spots.* If the light is not sufficiently screened out of the dark-tent or chemical-room, or you develop too near an artificial light, the *whole impression will be fogged*, and the body of the film more or less indurated throughout, *and the fog will not rub or dust off.*

If certain your negative bath, collodion, and developer are right, you may take this test as an infallible indication that there is a leak of light somewhere. Examine both sides of the plate-shield and front of the camera. *If the fog dusts off*, it shows the developer is at fault. Always on the first indication of fog apply this test.

To get a clear, well-defined image, there must be no action of light on the sensitized plate *previous* to its exposure in the camera, and then *only* from rays reflected by the *view* through the lens.

Light is to the photographer an indispensable

servant, but a bad master. You will, therefore, effectually guard against its intrusion in the dark-room. Have plenty of light to work by; we know of nothing more disagreeable than operating by a dim sight-straining light, but screen it with a yellow medium,—glass, paper, or muslin. Glass stained with tincture of iodine and varnish mixed and flowed on, serves the purpose well in a room. When either of the latter are used, have at least two plies of the material, and more if the sunlight strikes it, but strive to avoid this in the position of your dark-tent, or the arrangement of your chemical room.

Satisfied the trouble is not here, you will next look into the condition of your negative bath, which may not be entirely above suspicion.

First see that it is always covered to exclude light and dust. If left open on going out and in your tent, foggy plates will be the certain result. Has it been *recently* filtered and exposed during this operation to the action of light? This treatment is good for purifying a solution, but the best bath will fog unless excluded from the light several hours before using.

The ways out of these difficulties being obvious, we will now test for ALKALINITY. *It* may be the cause—especially if freshly made from a boiled or fused solution, or new crystals adulterated.

In making your examinations here, use a good amber-colored collodion which you *know* to be right. Develop with a good *well-filtered* de-

veloper, but before dipping a plate test with litmus paper ; if it indicates an alkaline condition, this settles the question at once. If it gives but a *feeble* acid reaction, it will require the same remedy as alkalinity,—C. P. nitric acid, a trace at a time from the end of the dipper. Try a negative after each addition until it gives clear blacks and transparent shadows, *with short exposures.* THE SURFACE OF THE WHOLE PLATES APPEARS MISTY, and *the shadows more or less veiled*, but *not entirely obscured* as when acted on by light. *The fog permeates the whole structure of the film*, and it *will not rub off* so as to leave *pure clear blacks.* The cause is, impurities of the water used in preparing the bath, or possibly of that with which you wash off the developer.

It should be pure soft water, free from lime, or saline properties and sulphur. These have a strong affinity for silver, and when brought in contact with it a foggy precipitate is the consequence. Use pure soft water for the developing solution ; then to make sure work, add a few crystals of silver, so that the union with deleterious substances may take place and the impurities got rid of by precipitation.

AN INSUFFICIENT QUANTITY OF ACETIC ACID, to restrain the reduction of silver with the iron salts, will cause fogging. Use to the full proportion given in the formula, but not much more, unless working in a very warm atmosphere.

A DEVELOPER *too* STRONG will also fog. It *flashes* out the image which indurates the surface of the film *only*. If the image or impression disappears in fixing with cyanide you may rest assured the CAUSE is here. This is very liable to occur in hot weather, and one of the gravest difficulties the landscape photographer may have to encounter. It may cost him great effort to get out of the "fog" here. First, if possible, shelter your dark-tent from the direct rays of the sun. Keep everything as cool as possible, then reduce your developer—add more acid, and you may have to *tone down* the strength of *all* your solutions, until *flashy superficial* impressions disappear, and the development is limited to manageable action. At such a trying time have your camera planted near at hand, or your tent near the instrument, and cover or shelter it also. Immerse the plate but a short time. Have the focus adjusted, transfer the plate to the camera, expose and develop as expeditiously as possible. While on this subject, we will suggest that this solution should not be *dashed* on, or the plate *flooded* by *torrents*. This will wash off the silver at the point of greatest friction, and leave a transparent spot—the mark of unskilful manipulation. This would also wash off a portion of the silver and thus rob your negative of strength.

OVER-EXPOSURE will give a misty, *flat* impression, with perhaps a *little clearness* in the *deepest* shadows.

STREAKS and LINES in the direction of the dip indicate impurities in the negative solution from long use, or recently made by getting it so from foul plates, or contaminated with developing agents. Wash your fingers effectually after handling each plate, and eschew dirty hand-towels. There is no cure for this state of affairs but to overhaul your bath, neutralize with carbonate of silver, and set in the sun. If it has been used some time, weigh with the hydrometer, and strengthen to 40°. If pinholes appear, or you have reason to anticipate their visit soon, reduce it with pure water, shake up, and *filter out* the excess of bromo-iodide of silver. Boil down to the original quantity of solution, and you get rid of another nuisance at the same time, *excess* of *ether* and *alcohol*, which prevents the bath solution from flowing a smooth surface on the plate when sensitized, and causes it to lay in *streaks* or *ridges*, as if the film were greasy. It develops unevenly, giving a heavier deposit of silver in the *ridgy lines*.

Look out for this difficulty in an old well-worn solution. A similar defect will appear on using a developer without sufficient alcohol to make it flow evenly. This is its office here, and it should not be used in greater quantity than will effect this purpose.

LACK OF INTENSITY is a common cause of complaint with some operators. This may result from *under-exposure*, giving a thin ambro-

type impression from too much bromide salts in the collodion, which should never be overdosed with it at first. To remedy this, add a sample of collodion simply iodized. The use of a red acid collodion will not yield good negatives. Use it to mix with pale, new, or neutral collodion, or for ferrotypes. *An exhausted, weak acid negative bath* will not yield an impression of any strength, and is unfit for taking negatives. If very acid, neutralize with carbonate of silver, sun or boil, then treat with permanganate of potash, and filter, as previously directed for "renovating an old negative solution."

We now come to the consideration of THE ILLS that AFFECT the COLLODION. Have it of an amber color, or a little *rosy* if for taking stereoscopic negatives, by adding of a *red* or *wine*-colored sample. If the film is *thin* and yields a *weak* negative, thicken with a rich sample of collodion laid by for the purpose; adding cotton is apt to result in uneven consistency, which would prevent it from laying smoothly. If too *thick*, a *leathery* film of *coarse structure* results. Thin it with alcohol in hot weather; ether and alcohol if cold. If *glutinous*, *clotty*, and *parting* in places, thin with ether alone. If crapy or reticulated, there is *too much water* where there should be little or *none*. If you have not used any in iodizing, which you *should not*, as the purest alcohol we can get has enough to dissolve the bromide salts, and sometimes *too much* for

the purpose of making collodion. The alcohol or ether may be acid, or otherwise impure, causing streaks and *hairy-like lines* in the developed image. The cure for worthless collodion, is to banish it from your reach, rinse out the bottle with ether, and take a new sample.

Order the best materials. First test the cotton, which may be either acid or alkaline when it should be neutral. A thorough washing with pure water will correct it; dry thoroughly in the sun before using. The proof of the alcohol should be at least 90 per cent., and the specific gravity of the ether should be from 700° to 725°. A prudent operator will always test materials before compounding in any quantity.

These expedients for working over should be resorted to *only* in case of *necessity*, or if beyond the reach of a fresh supply. To neutralize and concentrate alcohol or ether, add *small quantities at a time*, to prevent accidents, of pulverized *unslacked* lime.

Keep your ether bottle well sealed and excluded from the light, or acetic acid will form in it spontaneously. A bad sample of ether is a worthless, not to say dangerous, article, but inferior alcohol can be used for burning, cleaning plates, or even in the developer.

Collodion giving a *transparent blue film* as taken from the bath is not iodized enough; cautiously apply the remedy,—more iodizing solution. If presenting an *ivory-like density*, and after de-

velopment a *streaky* or *foggy*, *dingy*, *bad effect*, it is dosed to excess, and must be *reduced* with plain collodion. A fair specimen of *marbling* may be obtained by letting your plate stand too long in the holder before developing, or by not keeping the same clean and well shellacked, or not dipping the plate properly. Before beginning work, *draw filtering* or *other clean paper over the negative solution.* This will save you from many clouds and streaks at the outset. *Swab* and *rinse* out your *bath-cup* occasionally. Brush your plates before flowing, and give them a gentle churning motion in lifting them from the bath.

If you would enjoy immunity from *spots* and *specks*, avoid scales and flakes of dry collodion, sedimentary deposits, and dust and dirt in all shapes.

What is termed *pinholes* are caused either by excess of iodide in the bath, the *dregs* of *developer*, or working with the solutions too cold. To remedy the first, see article "To renovate an old negative bath," p. 24.

Always ventilate the chemical-room when not operating. Keep your work-room free from the fumes of acids, ammonia, cyanide, and smoke. They are not only inimical to good chemical effects but detrimental to health.

This is quite an array of mishaps, and will serve to show at least that photography is not all smooth sailing; but for the comfort of the troubled tyro or amateur, the Oracle assures us

these are the worst, and that *they*, as well as *all others*, can *surely* be mastered by the *resolute* and *persevering*.

COUNSELS AND CAUTIONS FOR THE PRINTER.

Owing to the great perfection attained in preparing albumen paper, as well as in the method of sensitizing the same, the duties of the photographic printer are quite simple and easy.

With a good negative and ordinary care in printing, and attention to the few suggestions here given, will lead to certain and satisfactory results. It is our purpose to present a few safe rules and formulæ, and not to mislead or confuse by a multiplicity of those of doubtful value.

1st. Provide pure soft water for making up the printing bath. Prepare in good quantity, rather stronger or more concentrated than it is to be used. It is better to have your stock of silver in this condition than in crystals. By this means whatever impurities may be in them can be eliminated. Have also a supply of pure water with a trace of silver added to reduce with.

Of course good results may be had without these precautions, but the path of prudence and perfection lies in this direction. We advise a *system*, and making this a part of it.

2d. Have, as previously suggested, litmus paper and an actino-hydrometer at hand, as a printing solution needs frequent strengthening and replen-

ishing, and their use is indispensable unless you are gifted in guessing. They are the photographer's square and rule.

3d. Determine what strength the bath should be for the paper and the grade of negative used, and then keep it quite up to this standard by adding from time to time of the strong stock solution of silver. This is best to be done immediately after silvering, and when filtering back from the dish to the bottle or jar.

The silver solution may be used with good results ranging from 30 to 80 or 100 grains to the ounce, according to the negative and salting and preparation of the paper. The less salt the less silver, and highly salted requiring more. 60 or 70 grains is a safe standard, and gives fair if not splendid prints with any good paper.

Use judgment, and be guided by the character of the impression. Avoid the hardness which a very strong bath would give, and the chalky harsh tones—lacking softness and detail—resulting from a very weak one. A medium strength of solution has this advantage, that it does not require frequent strengthening to keep it in working limits.

We submit the following as a reliable FORMULA for a

PRINTING BATH FOR ALBUMENIZED PAPER.

Nitrate of Silver, ...	2 ounces.
Pure Water, ...	14 "
Nitric Acid, ...	30 minims.
Ammonia Conc. (about) . .	40 "
Alcohol, ...	1 ounce.

Standard strength 65 grains.

After dissolving the crystals (if crystals are used) throw in a slip of test-paper. Then the acid *before* the ammonia. Introduce the ammonia cautiously, keeping your eye upon the test-paper, shake well after each addition, and when the litmus changes to a clear blue you have sufficient, at least at this stage of preparation. Lastly add the alcohol.

To change the order of adding the acid and ammonia would be quite likely to cause the albumen to slough off badly from the paper in sensitizing. This we conjecture is caused by an excess of the oxide of silver being precipitated in larger quantity than when the acid precedes the ammonia.

This method of preparation will give a solution that will rarely discolor or foul, even without alcohol. Filter carefully, pour out in a perfectly clean dish, level up, and you are ready for silvering.

Aim to lay the paper smoothly on the surface. Take it by opposite corners, lower the upper and

right-hand corner first, then the left-hand corner with a steady movement—avoiding bubbles.

Float from one-half to three minutes, according to temperature. In hot weather half a minute will be sufficient. Take up the paper with a slow gradual motion to avoid waste of silver by dripping, or draw the sheet over the edge of the dish or a glass rod. Hang it up to dry in a very dry, airy, dark place, or dry by artificial heat. *Dry quickly.* Fume with concentrated ammonia from three to fifteen minutes, varying with the temperature and strength of the ammonia.

Make a print; if too red or brownish, without life and brilliancy, fume longer, and add a few drops of ammonia to the printing bath. If too cold and blue, add a few drops of nitric acid, but not to redden the litmus paper in the bath. If it should be acid, change to an alkaline condition before silvering more paper. Never use an *acid printing bath.* This is a frequent cause of imperfect tones and measling.

An improvement in the preparation of the printing bath by H. T. Anthony has been recently made and generously published by him.

Finding it an excellent process, we will give it a place here without any further comments.

Formula reduced to one-ounce basis.

ANTHONY'S ALUM BATH.

Nitrate of Silver, ...	1 ounce.
Water (fluid ounces), . . .	5 "
Alum (pulverized), . . .	5 gramme.
Ammonia (conc.), about . .	5 drops.

When the silver is perfectly dissolved add the ammonia. Shake well. Then allow the oxide of silver to settle. Decant off the clear liquid, then add the pulverized alum.

Finally, to reduce to 40 grains, water, 7 ounces; float the paper 1 minute; fume after drying thoroughly 5 to 10 minutes; soak the prints before washing 15 minutes, in a weak solution of acetic acid and water, very weak—barely tasting of acid; then wash the prints in two waters, and tone in any good toning bath to a rich brown, avoiding blue tones.

Mr. C. Meinerth's method of preparing the

ALUM SILVERING BATH.

Silver, ...	1 ounce.
Water, ...	4 ounces.

When completely dissolved, add

Nitric Acid (stir well), . . .	5 drops.
Ammonia conc. (stir well), . .	8 "
Saturated Solution of Alum, .	2 drachms.

Shake up well and add

Water, ...	8 ounces.
Alcohol, ...	½ ounce.

When wanted for silvering, filter, but leave the sediment in the stock-bottle, into which filter back the solution after silvering.

Float 30 seconds. Dry quickly and perfectly. Fume from 5 to 10 minutes.

FAILURES IN SILVERING ALBUMENIZED PAPER.

Spots, pale red or brownish, and the paper mottled, *do not show much*, if any, until *after printing. Cause:* Printing bath too weak, solution reduced below working standard by long use or the paper not floated long enough. Exhaustion is, however, almost invariably the cause of this trouble. *Remedy:* Strengthen up with more silver, and, if necessary, more ammonia or acid.

Spots, from drops or tears forming on the surface of the paper in drying—caused by too strong silver solution, not penetrating the albumen.

A too weak solution has the opposite effect,—*dissolves the albumen. Remedy:* Reduce the silver solution a trifle with water, and avoid the other extreme mentioned.

To save the paper already spotted, rub smooth with a clean tuft of cotton before it dries.

DISCOLORING OF THE PAPER, a difficulty in

hot weather. *Cause:* Silver solution too strong, or the paper floated too long, or hung to dry in a close damp place. *Remedy:* Try less time in floating, dry quickly, fume in a dry box. If this does not obviate the difficulty, reduce the bath a little, fume just before printing, tone as soon after printing as possible.

BROWNISH OR RED HUE TO THE PAPER AFTER PRINTING.—The bath has an excess of nitric acid. To correct, add ammonia.

BLUISH COLD HUE TO PAPER AFTER PRINTING.—Too much ammonia. Dispense with fuming; if this does not sufficiently remedy, add a little nitric acid.

DISCOLORING OF THE PRINTING SOLUTION.—Caused by a weak bath, or too much ammonia, causing an excess of the oxide of silver. The albumen on the surface of the paper dissolves and mingles with the solution. The paper dries with little or no gloss. It is difficult to float without causing bubbles. This is the first symptom, followed in a few hours by the solution turning brownish, then a dark color. *Remedy:* On the first appearance of bubbles cease silvering; then strengthen the solution with silver, add alcohol and a trace of alum. The addition of this is equivalent to filtering through kaolin or fire-clay (silicate alumina), and is much sooner done.

If the solution is not badly fouled, you may restore it by this means for present use. If badly

discolored and working off the albumen still, set it aside in the light, after tincturing to a bright purple with permanganate of potash. This method requires several hours to precipitate and purify, after which decant off, and filter.

The albumen may also be coagulated by *heat*, after which it may be filtered out.

Use an evaporating dish for this purpose, and bring the bath to a boil only—*not to fusion.*

The treatment with permanganate is preferable to boiling, and no photographic operator should think of being without it.

FAILURES IN TONING.

1st. *Prints too brownish or red.* Not toned long enough, or bath too weak or cold. More gold if it proves to be too weak.

2d. *Prints blue, cold, or bleached.* Toned to excess, solution too strong or hot. Reduce with water, or cool down as may be required.

3d. *Measly prints* may be caused by an acid printing solution, to begin with, or toning bath too alkaline, causing the gold to precipitate too freely. Restrain with acid.

If the strength of bath is not excessive, add a little acid gold solution, or a drop or so of muri atic, nitric, or citric acid.

4th. *Lack of brilliancy or purity.* The causes are various, and may originate in the first place with a weak negative; the use of impure water;

lack of silver or ammonia; insufficient fuming; or paper with poor gloss.

Make it a point to procure the best albumenized paper at whatever cost. Print your thin or weak negatives in the shade or under a screen.

A Golden Precept for the Printer.—Use care in the preparation of your *printing* as well as *toning bath. Be certain that both are alkaline. Neither one will work if at all acid. Avoid excess of alkalinity*—carrying it barely beyond the neutral point. Conform strictly to this precept and success is assured.

Print to a rather deep color, to lower the highlights slightly. *Secure strength* and *detail without heaviness.*

5th. *Prints tone slowly* and *imperfectly* with a full quantity of gold. Bath too acid, if not too cold, does not precipitate readily on the silver of the print.

Consult the test-paper which we will assume is already taking notes in the solution. If it is the least pinkish in color it needs *more soda.*

Too much citric acid will injure the bath. Use only at the rate of one to two grains to the ounce of water. An acetate of soda bath is liable to this difficulty if used with an overdose of it, or if freshly prepared. The salts should be used sparingly, and the bath should be made up full twenty-four hours before using it. Neu-

tralize cautiously, using but little soda. Citric acid and a very small quantity of this salt may be used in combination, giving a fine brownish-purple tone.

The citric acid bath is much easier to manage; works soon after making up, and yields good tones, varying to almost any shade desired. It is best, from its ease of management, especially for unpracticed hands.

Soaking and *washing* too long before toning the prints will render the toning difficult if not impossible, or if the operation of salting the prints previously to toning is carried to excess by having the salt solution too strong, or leaving the prints in it too long so as to give them a brick-red color.

Always wash quickly, and follow up with the toning immediately afterward. Use salt cautiously; not too strong; brackish, not briny.

The prints should be promptly taken from the salt solution as soon as they begin to turn brownish and put in fresh water, from which they can be passed to the toning dish while toning.

6th. *Spots or blotches, red or brownish; prints matted together in salt or acid solution, or in the toning bath.* Use a good supply of solution; keep prints well separated, and turn them over frequently; do not fill your toning dish with prints, but throw in a few at a time, and have the solution of a moderate or manageable strength.

7th. *Yellow, dingy spots and blotches* that will not fix out in the strongest fixing solution, caused

by getting hypo in the toning bath, or on the prints in washing them of silver. The smallest trace of contamination with hypo on the prints in the dishes or trays, or from the fingers in washing or toning, will do the business.

Chloride of gold or silver may be introduced into the hypo solution with impunity, but to reverse this process will invariably result in precipitating them, and discoloring and destroying the toning bath.

The *blotches* and opaque *spots* show plainly by transmitted light. They appear on the surface of a dirty yellowish tinge, and may not show plainly until after drying.

There is no cure or palliation in this case but to destroy the prints, and try it over again. Upon the first symptom of discoloring in the toning bath cease using it, and make up fresh. It may be, the untoned prints are not injured.

Let your hands be well washed with soap and water, if it has been necessary to handle the hypo before washing the prints or fuming.

8th. *Sulphurized yellowish prints.* The tone at first is fine; has a charming brilliancy, and the germ of decay and destruction will scarcely be suspected.

By close examination, a faint yellow tinge will be noticed in the cast of the white portions. The photographs do not wear well; the yellow tinge deepens; the half-tints bleach out, finally

the shadows and blacks melt away, and the destruction of the print is complete.

This is the certain fate of an imperfectly fixed or imperfectly washed photograph or silver print.

By improperly fixed, we mean using the fixing bath the second time. A photographer's work ought, if good for anything, to remain good during his own lifetime at least.

Perfect permanence of a silver print, however well finished, is questionable.

Every artist is in honor bound to do the best he can to secure so desirable a result in finishing his work.

Hypo is fortunately cheap and plenty; so is water. Use plenty of water, and see that in washing the prints are well separated.

FAILURES IN FIXING.

Imperfect fixation. The chloride of gold and silver not completely taken up from the prints by the hypo, either from lack of strength in the fixing solution, or the prints have not been immersed in it long enough.

The print blackens in the light, and cannot be remedied after drying.

The fixing is complete when the white portions appear pure and clear by a transmitted light.

Adopt the plan of making the fixing solution of uniform strength, and immersing the prints a regular period of time, varying slightly with the

heat and appearance of the print. Thin paper fixes sooner than heavy. Put the prints into the bath *face up;* agitate, turn, and keep them separated; wash quickly after fixing, and through two or three waters; finally leave the prints *face downward* several hours in pure running water.

Sulphurized stains appearing in spots, streaks, or irregular lines, stencil markings of the checked dish they may be fixed in, or from a foul fixing tray or checked porcelain dish in which a compound of sulphur and silver is lodged. The use of glass or hard rubber trays for fixing in will obviate this difficulty.

They should be washed frequently with a solution of soda, and rinsed clean.

FORMULA FOR FIXING PHOTOGRAPHIC OR SILVER PRINTS.

Hyposulphite of Soda, . . .	4 ounces.
Water, ...	24 "
Proportion of Water, . . .	6 "
To Hypo, ...	1 "

Fix prints from fifteen to twenty minutes.

INSTANTANEOUS PHOTOGRAPHY

Is limited to outdoor scenery, and owing to the necessity of using the most rapid, and, consequently, short focussed lenses, there is seldom any other size or style of instantaneous photograph taken than the stereoscope.

No one should attempt this branch of the art without a good, rapid, or quick-working lens, designed expressly for the purpose. The light should be strong, and the solutions must be fresh and of the greatest purity; the manipulation of the utmost cleanliness and dexterity.

Next in importance to having a good lens, is the preparation of the negative bath.

Success in a great degree depends upon its sensitiveness. To secure this, fused or semi-fused silver is to be employed in whole, or in large proportion, according to the degree of intensity desired.

The silver solution should be kept in stock (plain and fused separate), and mixed or modified to produce the desired effects.

Fused silver has the valuable properties of *sensitiveness* and *intensity*—both essential to success in instantaneous photography.

NEGATIVE BATH FOR INSTANTANEOUS PHOTOGRAPHY.

Nitrate of Silver, ...	40 grains.
Distilled Water, ...	1 ounce.
Silver (Fused), ...	40 grains.
Distilled Water, ...	1 ounce.

Use equal quantities of each; add a few drops of carbonate of silver solution, then C. P. nitric acid until the bath yields a perfectly clear im-

pression. The bath will be sufficiently sensitized by the immersion of the trial plates.

COLLODION FOR INSTANTANEOUS VIEWS.

Plain Collodion,	1 ounce.
Iodide of Potassium,	3 grains.
Iodide of Ammonium,	2 "
Bromide of Ammonium,	1½ "
Chloroform,	5 drops.

Make an alcoholic tincture of these ingredients (the iodizers), leaving out the chloroform; sensitize the plain collodion to the highest limit it will admit of without streaking or fogging; lastly, add the chloroform.

DEVELOPER FOR INSTANTANEOUS WORK.

Protosulphate of Iron,	1 ounce.
Sulphate of Copper,	1 drachm.
Distilled Water,	10 ounces.
Acetic Acid,	2 "
Alcohol,	1 "

The proportion of iron salts is to be varied to suit the temperature, and should be as strong as it can be used to develop evenly.

Use the purest acetic acid in sufficient quantity to secure a clear effect, free from all symptoms of fog.

Wash the developer from the plate with *pure* or *distilled* water.

Fix with cyanide, using caution not to have it too strong; husband and protect the half-tints.

Finally, if the impression lacks intensity, reinforce with gold or redevelop. Considerable strength may be imparted by drying the wet plate by artificial heat. Varnish with "Clemons's Varnish," or other hard, quick-setting varnish.

VIEW PHOTOGRAPHY FINANCIALLY CONSIDERED.

I think there is not a photographer in the land but might derive great profit by the use of a good view outfit, and avail himself of the advantages and elements of success to be found in this branch of the art. It might also be adapted with advantage by some as a *specialty*. If pushed with tact and energy it will open a field of profit, both direct and indirect, that can hardly fail to double the business of any gallery. The path of progress in the future clearly lies in this direction. The wonderful improvements in photographic printing, as developed in the "Woodbury" or "Photo-Relief Process," perhaps to be followed by others as good, if not better. Mechanical processes enable us to duplicate our work in unfading colors, with marvellous perfection and rapidity. This, in turn, will create an unlimited demand for negatives. Even now the cry is "Negatives! More good negatives!" Photography is now, and henceforth to be, the hand-

maiden and co-worker of the printing press. The world of art *must have*, and *will pay* for, views of all objects, animate and inanimate, beautiful or useful, which nothing but the camera can render with such *unapproachable and unimpeachable perfection*. The pages of science, of art, and may we not add, of literature, are to be lit up by the millennium brightness of the silver sunbeam.

To those who have the good fortune to possess an outfit we would say, redouble your zeal in using it. To those who have not, get one. It will enable you to make an attractive display on your walls, centre-table, and the portals of your establishment. This will attract the multitude of picture lovers and picture buyers; in other words, customers. Presuming you already have charming specimens of portraiture, and capacity for making more of the same sort, you will, in this way, be able to greatly extend this, your main business. You will also, by this means, be educating the taste of your customers, and thus create a demand for views of all kinds, frames, stereoscopes, bound volumes of views, &c., gaining by this means an important source of prosperity; and you may, even in this line, beguile them into reading and buying beautiful portfolios of sunlit art.

Keep a stock of stereoscope boxes of various prices and styles of finish. At this time there is nothing better than those known in the trade as

the "Holmes Scope." They should, and probably will, become as popular as the album; keep a good stock of stereo slides, and larger views; have as many of your own taking of objects of local or general interest in your own neighborhood as you can, but do not limit yourself or patrons to those only; seek by purchase or exchange to keep a good selection for sale and exhibition, and may we suggest—*for study*.

A good view artist may always rely upon getting orders for photographing residences, mills, factories, public buildings, bridges, store and shop fronts, boats, machinery, and indoor views of parlors, dining-rooms, greenhouses, bay-windows, graperies, copies of drawings, &c. Beyond this opens a vast field of such objects of historic, romantic, or picturesque interest as the good taste or poetic fancy of the operator may select. The most striking and charming view or views of your city or village streets always find a ready sale. Public buildings, schools, and churches sell well. *First, take your negatives, then call on your fellow-townsmen or business men for orders from the proof.* Natural scenery in your vicinity, if not too tame, even the cemetery, offers good subjects. There is scarcely a locality in this, the youngest of nations, that has not its revered *relic of history or romance.* To a man of taste and skill, even the *rocks* may be turned into bread; but remember, like a good cook, he must

serve up his feast in a *tasteful and inviting manner.*

STEREOSCOPING APPLIED TO PORTRAITURE.

It may not be considered amiss in this connection to offer a few suggestions on this subject. It has long appeared to me that a good portion of our photographic brethren might introduce the stereoscope in portraiture with great benefit to themselves, and satisfaction to their patrons. They present with tasteful accessories a pleasing picture, and as a likeness, realize more nearly the *personal embodiment* of the subject than any other. The multitude, it is true, will prefer something less expensive, but there are those who *want something new and good* without regard to price This class of customers are worth catering for, and in time a good trade could be built up in this line. It would, at all events, be adding another resource of material advantage to your business. The fixtures and accessories, such as scenic backgrounds, tables, curtains, &c., necessary for this work, are to be found in every gallery. In addition, many will want a suitable camera, and for this purpose you will need a pair of matched lenses, either quick or instantaneous workers, or a pair of one-quarter portrait lenses, of the best make. They should be provided with central stops, and might be used with smallest stop for outdoor work, although they are not the

best for this purpose. They should be mounted on a stereo camera box carrying a plate 8 x 5 inches. Take full-length figures sitting or standing; pose and arrange your subjects tastefully, and finish and mount as stereographs, or, if desired, they could be used for cartes de visite, or Victoria cards.

CONCLUDING REMARKS.

Permit me to close this little essay with a few words of counsel. Keep posted; avail yourself of the experience of others as far as practicable. It may be only a crumb here and there.

Let your name be on all the subscription books of the few but excellent journals devoted to our interests and improvement. No man should be satisfied with mediocrity, and at this day you will be left in the rear in the march of progress without their aid.

Be thoroughly enlightened in the technical as well as the practical branch of the art. Cultivate a generous and fraternal spirit towards fellow artists. Be willing to impart as well as to receive instruction from others. A generous spirit of emulation and enterprise is commendable, but avoid petty rivalry. *Keep up good prices, and see that your patrons get the worth of their money.*

Rely upon *good work* and *real merit*, rather than low prices, to win your way to public favor.

To those in the A B C of photography we would say, "Learn your business *well* before tapping on the pockets of the public." Full-fledged photographs, unlike mushrooms, cannot be grown in a night.

With room full of customers, or "Dame Nature" herself waiting to have her "picture took," there cannot be a more *trying situation* than that of an operator floundering, amid baths and bottles of bewitched solutions, in utter dismay and *darkness*.

To learn the business thoroughly should be your ambition. Study the principles of art composition, and chemistry. Ascertain the *effect* of every chemical—their *modifying effect* when combined; their effect when used in extremes—either too much or too little. See if you have exposed too long or have under-exposed, developed imperfectly or occasionally with solutions too strong or too weak, and with acid in excess or too scant, without acid or without alcohol, and so on with all the agents used in the art.

Note the different effects indelibly on the memory, and in good time you will master the situation.

Train yourself at the same time to habits of neatness and order, and I will add, *industry*.

If so disposed, an operator may always find *something* to do during hours of business.

Then be a *competent*, *neat*, *careful*, *industrious* workman, and you have the fundamental princi-

ples of success. Such you *must be* to become a valued assistant, or an honored and prosperous proprietor.

Hoping my readers may be materially benefited by the perusal and study of these precepts, and that the sunlight of prosperity may ever beam above them,

I am most gratefully and sincerely,

Your humble servant,

R. M. LINN,
Lookout Photographer.